Jacqueline

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

5A112004001

June 2, 2011
Project No.: 70309-03

Ms. Kathy Gallego
Sierra Nevada Cheese Company
6505 County Road 39
Willows, California 95988
Phone (530) 934-8660

REFERENCE: ***Sierra Nevada Cheese Company and Gregersen Properties, LLC***
Waste Discharge Order No. R5-2007-0043
Willows, Glenn County, California

SUBJECT: ***Monitoring Well Assessment Report***

Dear Ms. Gallego,

In response to your request, Holdrege & Kull (H&K) is pleased to present this Monitoring Well Assessment Report for the Sierra Nevada Cheese Company (SNCC). This report was prepared to address the Regional Water Quality Control Board (RWQCB) comments to the *Water Quality Assessment* (WQA) *Report for the SNCC and Gregerson Properties, LLC* (H&K, December 21, 2010) and their request for an engineering report provided in a letter dated March 8, 2010. A copy of the letter is provided as Attachment A for your reference.

This report provides an assessment of the ability of the existing monitoring well network to monitor potential impacts to groundwater from the wastewater ponds; The assessment is based on existing groundwater elevation data, well construction details, soil stratigraphy, an assessment of seasonal impacts from irrigation practices on adjacent properties, and potential influences from Walker Creek. Recommendations regarding well redevelopment, abandonment, and/or new well installation are presented based on the available data. This report also includes a summary of the estimated groundwater gradients and flow directions for 2010 and a work plan describing the proposed field tasks needed to implement the recommendations presented herein.

In addition, the RWQCB made comment to the 2009 Annual Report (*2009 Groundwater Flow Directions and Hydraulic Gradients* [H&K, January 26, 2010]) and requested that the groundwater gradient and flow direction for October 2009 be corrected. A revised version of the January 26, 2010 report was provided under separate cover dated February 2, 2011.

BACKGROUND

Site Location and Description

SNCC is located at 6505 County Road 39 in Willows, Glenn County, California. The cheese factory property includes 120 acres listed as Glenn County Assessor Parcel Numbers 020-160-0040 (96.9 acres), 020-160-0060 (12.3 acres), and 020-330-0049 (10.8 acres). A site location map is shown as Figure 1. The site layout including groundwater monitoring wells (MW-1 through MW-4) is shown on Figure 2. SNCC is approximately 140 feet above mean sea level (MSL) according to the United States Geological Survey (USGS) Willows quadrangle map, and previously included a gravel pit operation. Presently, the surrounding land use within 1,000 feet of the site consists of low density (rural) residential and agriculture operations, including olive orchards and rice fields. Since SNCC took over the processing facility in 2003, a significant reduction in the discharge of waste to land occurred.

SNCC's total processing water and non-contact cooling water waste stream is approximately 21,500 gallons per day. All wastewater produced at the site is currently discharged primarily to Ponds 1, 2, and 3, located east of the processing facility and periodically to Ponds 4 and 5 during the rainy season. No wastewater is discharged to Ponds 6 and 7 or to Walker Creek.

Hydrologic Setting and Site Geology

The SNCC facility is within the Colusa Trough Hydrologic Subarea (No. 520.21), as depicted on interagency hydrologic maps prepared by the Department of Water Resources (DWR), August 1986. Surface water in the vicinity drains to Walker Creek, which is a tributary of Willow Creek, a tributary of Colusa Trough, and a tributary of Colusa Basin Drain.

The geology for the site is based on monitoring wells logs of four shallow groundwater monitoring wells. According to the monitoring well logs (Taber Consultants [Taber], May 7 1990), soils in the vicinity of the wastewater ponds vary widely and consist of gravel, sandy gravel, sand, silt, gravelly silt, sandy silt, clayey silt, sandy clay, and silty clay to the depth explored (approximately 30 feet). Copies of the wells logs are provided as Attachment B. The water bearing unit of each well or the presence of first water is not noted on the well logs. Therefore, one or more of the lithologic units identified in each borehole may be a source of groundwater to the well. Furthermore, the distance between wells is large enough that the connectivity of water bearing units from well to well may not be defined. Groundwater has been measured in these wells at depths of 2.5 to 26.30 feet below top of casing. No site-specific flow direction has been determined, however, shallow groundwater is expected to flow in the direction of Walker Creek, to the southeast.

DESCRIPTION OF WASTE AND WASTE HANDLING OPERATIONS

Approximately 95,000 gallons of milk are processed monthly to produce varieties of cheese, yogurt, butter, and sour cream. The addition of salt to the curd occurs after the whey has been drained, therefore avoiding the generation of high saline waters

being discharged to the wastewater ponds. Two waste streams are produced during the production: process wastewater and non-contact cooling water. The process water is mainly whey waters generated during the cheese production as well as wash water used to clean equipment. Cooling water is supplied from the on-site water well and used to cool the compressor and culture vats. The cooling water effluent is similar to the water quality of the regional groundwater when discharged.

There are a total of seven unlined wastewater ponds with approximately 201 million gallons of capacity available for treating effluent wastewater by providing aeration, biological degradation, settling, and percolation through the soil. Based on the current facility use and production, an average annual waste of 7.8 million gallons is discharged to the ponds. The wastewater is primarily discharged to three unlined wastewater ponds (Pond 1, Pond 2, and Pond 3) with a total capacity of 16.1 million gallons and periodically discharged to Ponds 4 and 5 during the rainy season.

SNCC does not anticipate future usage of Ponds 6, and 7. They have partnered with Cottonwood Creek to divert the waste stream through a wastewater treatment system that employs aerobic fermentation technology. Once the system is brought on line, organic and mineral pollutants will be removed from wastewater and the solids will be dried and reused off site. Thereby, eliminating discharge of solids to the ponds and increasing their lifespan under the current rate of production. The timeline for bringing the system on line is dependent on the funding stream of Cottonwood Creek.

PERIODIC MONITORING AND REPORTING

SNCC is required to perform weekly, monthly, and quarterly monitoring and reporting of the waste streams in accordance with the Monitoring and Reporting Program (MRP) R5-2007-0043. SNCC performs the flow monitoring, pond monitoring, groundwater monitoring, solids monitoring, and leach field monitoring and reporting in-house. SNCC contracts with a California-certified laboratory (FGL Environmental of Chico, California) to perform the groundwater analyses, and provides depth to groundwater measurements to H&K for calculating the groundwater flow direction and gradient. The laboratory analytical results and groundwater flow directions and gradients are included in the appropriate reports forwarded to the RWQCB by SNCC.

H&K submitted the *Water Quality Assessment* (WQA) *Report for the SNCC and Gregerson Properties, LLC* (December 21, 2009). The report included a summary of monitoring data and a general assessment of the groundwater quality based on quarterly monitoring data collected from March 2007 through July 2009. The following conclusions were presented:

- Because of the data gaps in the monitoring record, a determination of the designated background monitoring well could not be established and the comparison in accordance with Title 27, Section 20415(e)(10) cannot be completed.
- An intra-well comparison shows that the groundwater analytical results for the constituents monitored in the first water bearing unit beneath the site are

generally consistent and an order of magnitude or more lower than the concentrations established for the waste stream.

- Based on our knowledge of the shallow groundwater quality from other regulated waste disposal sites within the vicinity, the concentrations detected in the monitoring wells appear to be within range of expected water quality values.

The data gaps identified in the WQA report and spikes in the standard minerals that coincide with agricultural practices in the area, and the location of MW-3 in a rice field were cited in the RWQCB March 8, 2010 letter as reason for assessing the ability of the monitoring well network to monitor potential groundwater impacts from the wastewater ponds.

Since July 2009, SNCC has conducted five additional quarterly groundwater monitoring events (4Q09 through 4Q10). In addition, SNCC began measuring depth to groundwater on a monthly basis beginning April 2010 in response to the RWQCB request presented in the their March 8, 2010 letter. Measurements beginning April 2010 are also measured to the nearest 0.01 foot using an electronic sounding probe. These data are considered to be more reliable than all previous depth to groundwater data. Table 1 presents the quarterly and monthly depth to groundwater data provided by SNCC and the calculated groundwater elevation in each monitoring well. Table 2 presents the groundwater flow directions and gradients calculated by H&K using the depth to groundwater data provided by SNCC. A graph of historical groundwater elevations are presented as Figure 3.

- As shown on Figure 3, the groundwater elevation data at MW-2 appears to show a seasonal fluctuation. That is, increasing elevations in the late fall/early winter through early spring and decreasing elevations into late spring through the fall. Groundwater elevations at MW-1, MW-3, and MW-4 appear to show seasonal fluctuations with other influences possibly from irrigation, Walker Creek, or from other unknown sources. The level at MW-3 appears to be influenced by overwinter flooding and spring/summer flood irrigation of the rice field. Although the beginning and end of overwinter flooding and irrigation of the rice field is not documented, flooding and drying events appear to be evident in the water level data. This may also affect the levels in MW-1 and MW-4. In addition, the levels at MW-1 and MW-4 may be influenced by fluctuating water levels in Walker Creek; however, water levels in the creek are also not documented. Walker Creek may contribute to groundwater during the dry season when groundwater levels are lower than the surface water level and conversely during the wet season.
- Estimates of the 2010 groundwater flow directions calculated from the groundwater level data recorded from the site monitoring wells are highly variable and inconsistent (Table 2). Calculations result in groundwater flow directions in multiple compass quadrants or a single quadrant for any one measuring event and the variability does not appear to follow any discernable pattern. Overall, the variable flow directions may be due to the large distances between wells, seasonal flooding of the rice fields, influences from Walker Creek (possibly as a groundwater divide or a localized effect on the dominant flow direction of shallow

groundwater), or other unknown factors. Monthly groundwater level data from the current monitoring well network does not appear to be contributing to increased definition of a flow direction beneath the SNCC site. Therefore, it appears that monthly measurements may not be appropriate at this time and it is recommended that the frequency of groundwater level measuring be reduced to quarterly to coincide with the quarterly sampling events. Once the recommended changes to the monitoring well network discussed below are implemented, monthly groundwater level measurements may again be appropriate.

- Due to the continued variability of the calculated flow directions, no background monitoring well can be determined.

SNCC collects groundwater samples from the site monitoring wells and measures field parameters (temperature, pH, and electrical conductivity, and total dissolved solids) using a multi-parameter meter. Total metals (arsenic, calcium, iron, magnesium, manganese, potassium, and sodium) are analyzed using United State Environmental Protection Agency (EPA) Method 200.7. Ammonia as nitrogen is analyzed by EPA Method 4500NH3H, alkalinity, bicarbonate, carbonate, and hydroxide by EPA Method 2320B, biological oxygen demand by EPA Method 5210B, chloride, nitrate as nitrogen, and sulfate by EPA Method 300.0, total kjeldahl nitrogen by EPA Method 351.1, and fixed dissolved solids by EPA Method 2540C. The groundwater monitoring well analytical results through October 2010 are presented in Table 3.

- Because of the variable flow direction discussed above, a background well cannot be determined and statistical analysis for the determination of background water quality cannot be performed. Thus a comparison of background concentrations to compliance well concentrations cannot be performed.
- Concentrations of total iron, magnesium, manganese, and potassium showed significant increases in samples collected from MW-1, MW-3, and MW-4 during July and October 2009. The largest concentration increases were measured at MW-3, which is located in the middle of a rice field. The application of fertilizers to the surrounding properties may be the cause of the increased concentrations. Data for July 2010 do not show the same concentration trend increases; however, data for October 2010 indicate an increase from July 2010 but remain one to two orders of magnitude less than the 2009 results. It is possible that sediment in the water sample may influence the results because the analyses are for total metal concentrations and not dissolved metal concentrations. Acid preservative may be leaching metals from the sediment. Future metals analyses should be for dissolved metals only.

sample digested?

MONITORING WELL NETWORK ASSESSMENT

This section discusses proposed changes to the monitoring well network that are needed to obtain data for determining the groundwater flow direction and gradient beneath the wastewater ponds and for assessing potential wastewater releases from the ponds.

Monitoring well MW-3 is recommended for abandonment because it is located in a rice field that is flooded several months of the year; both during the growing season and during the winter. The agricultural practices (irrigation and fertilizing) and overwinter flooding may be impacting groundwater levels and shallow groundwater quality at this location. In addition, this well is approximately 1,000 feet from the nearest wastewater pond (Pond 5). This well is not a good candidate for detecting potential releases of wastewater under current operating conditions where the majority of the wastewater is discharged to Ponds 1, 2, and 3. However, SNCC periodically discharges wastewater to Ponds 4 and 5, therefore, a replacement well (MW-5) located closer to those ponds is recommended to be installed. The proposed location of MW-5 is shown on Figure 2.

The location of monitoring well MW-2 is problematic for determining the flow direction and gradient beneath Ponds 1, 2, and 3. It is approximately 2,500 feet to the next nearest monitoring well (MW-4), which is a large distance over a very flat gradient. Both MW-2 and MW-4 are on the north side of Walker Creek which may be acting as a groundwater divide. MW-2 also has gaps in the data record due to the groundwater level falling below the level of the screen, which reduces the reliability of the gradient and flow direction calculation based on a single triangulation. Groundwater samples from this well may not represent background water quality for groundwater flowing beneath Ponds 1, 2, and 3. Therefore, an additional well (MW-6) located south of Walker Creek in the assumed up gradient direction of Ponds 1, 2, and 3 is recommended to be installed. The proposed location of MW-6 is shown on Figure 2.

In accordance with the RWQCB request, one new monitoring well (MW-7) is also recommended to be installed south of Ponds 1, 2, and 3. The purpose of this well is to capture potential wastewater releases south of the ponds. The proposed location is shown on Figure 2.

H&K measured the total depths of the wells on October 27, 2010 to determine if the wells needed to be redeveloped. Wells MW-1, MW-2, and MW-4 are not recommended for redevelopment. Each of the well depths was within 1 foot of the reported depth on the monitoring well logs (Taber, 1990). Well MW-3 was silted up approximately 5 feet from the bottom, suggesting that the structural integrity of this well may be compromised. This well is recommended for abandonment and does not need to be redeveloped.

RECOMMENDATIONS

This section summarizes the recommendations discussed in the previous section. The recommendations made are based on the data available at the time this report was written.

- Reduce the frequency of groundwater level measuring from monthly to quarterly until changes to the monitoring well network are implemented. Then reevaluate whether an increase of frequency is needed.

- Discontinue groundwater monitoring and sampling of well MW-3 after the first quarter 2010 event and abandon the well. ok
- Increase the height of the riser casing and install expansion caps on wells MW-1 and MW-4 to protect from inundation during flooding of Walker Creek. ok
- Analyze for dissolved metals during future quarterly groundwater monitoring. No
- Install proposed monitoring wells MW-5, MW-6, and MW-7 to monitor the first water bearing unit. MW-5 is proposed east of Ponds 4 and 5. MW-6 is proposed to be installed south of Walker Creek in the assumed up gradient direction from Ponds 1, 2, and 3. MW-7 is proposed to be installed south of Ponds 1, 2, and 3. ok

WORK PLAN

A work plan for the drilling and construction for the three proposed groundwater monitoring wells is provided in Attachment C. The work plan describes the proposed field tasks, well construction details, and reporting to be implemented upon RWQCB comment and concurrence with the recommendations presented in this report.

LIMITATIONS

The purpose of the Engineering Report was to assess site conditions in accordance with generally accepted engineering practice in northern California. H&K has used professional judgment and experience to arrive at the conclusions presented herein. Therefore, the conclusions are not to be considered scientific certainties. The recommendations provided herein are contingent upon H&K's review of any future site data or other pertinent information that becomes available.

H&K performed this work in accordance with present, regional, generally accepted standards of care. This report does not represent a legal opinion. No warranty, expressed or implied, including any implied warranty of merchantability or fitness for the purpose is made or intended in connection with the work. H&K prepared and issued this Engineering Report for the exclusive use of our client. H&K is not responsible for any other party's interpretations of the reported information.

No environmental investigation can eliminate all uncertainty because the concentrations detected in the samples collected during site investigation may not be representative of conditions between locations sampled. Other forms of contamination may be present within the site. Professional judgment and interpretation are inherent in the site investigation process, and uncertainty regarding site conditions cannot be completely eliminated.

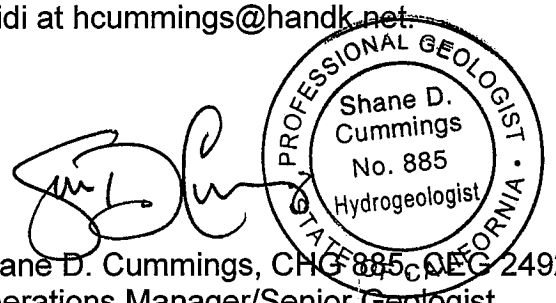
The findings of this report are valid as of the present date. However, changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. Changes in regulations, interpretations, and/or enforcement policies may occur at any time. Such changes may affect the extent of investigation required.

CLOSING

If you have questions or comments, please do not hesitate to call either the undersigned at (530) 894-2487 or email Heidi at hcummings@handk.net.

Sincerely,
Holdrege & Kull

Heidi Cummings



Heidi Cummings, PG 7732
Senior Geologist

Shane D. Cummings, CHG 885, CEG 2492
Operations Manager/Senior Geologist

Attachments

Tables	
Figures	
Attachment A	RWQCB Letter, March 8, 2010
Attachment B	Monitoring Well Logs (Taber, 1990)
Attachment C	Work Plan

TABLES

1. Monitoring Well Groundwater Elevation Data
2. Groundwater Flow Direction and Gradient
3. Groundwater Monitoring Well Analytical Results

Table 1. MONITORING WELL GROUNDWATER ELEVATION DATA

June 2007 through July 2010

Sierra Nevada Cheese Company, Willows, California

Well Number	Date Measured	Top of Casing Elevation (feet msl)	Total Depth [a] (feet bgs)	Bottom of Well Elevation (feet msl)	Screened Interval (feet msl)	Depth to Groundwater [b] (feet below TOC)	Groundwater Elevation (feet msl)	Change From Previous (feet)
MW-1	Jun-07	144.62	24.7	119.92	140.62 -120.62	**		
	Sep-07					**		
	Jan-08					**		
	Apr-08					**		
	Sep-08					20.30	124.32	
	Nov-08					22.80	121.82	-2.50
	Jan-09					22.65	121.97	0.15
	Apr-09					14.67	129.95	7.98
	Jul-09					22.84	121.78	-8.17
	Oct-09					21.86	122.76	0.98
(c)	Jan-10					2.54	142.08	not calculated
(d)	Apr-10					12.35	132.27	not calculated
	May-10					14.33	130.29	-1.98
	Jun-10					13.58	131.04	0.75
	Jul-10					16.65	127.97	-3.07
	Aug-10					15.20	129.42	1.45
	Sep-10					13.60	131.02	1.60
	Oct-10					13.22	131.40	0.38

Table 1. MONITORING WELL GROUNDWATER ELEVATION DATA

June 2007 through July 2010

Sierra Nevada Cheese Company, Willows, California

Well Number	Date Measured	Top of Casing Elevation (feet msl)	Total Depth [a] (feet bgs)	Bottom of Well Elevation (feet msl)	Screened Interval (feet msl)	Depth to Groundwater [b] (feet below TOC)	Groundwater Elevation (feet msl)	Change From Previous (feet)
MW-2	Jun-07	150.46	25.0	125.46	145.46 - 130.26	18.0	132.46	
	Sep-07					18.0	132.46	0.00
	Jan-08					18.00	132.46	0.00
	Apr-08					15.60	134.86	2.40
	Sep-08					DRY		
	Nov-08					DRY		
	Jan-09					DRY		
	Apr-09					20.92	129.54	
	Jul-09					DRY		
	Oct-09					26.30	124.16	
	Jan-10					24.00	126.46	2.30
(d)	Apr-10					20.00	130.46	4.00
	May-10					20.25	130.21	-0.25
	Jun-10					20.46	130.00	-0.21
	Jul-10					22.30	128.16	-1.84
	Aug-10					23.32	127.14	-1.02
	Sep-10					22.83	127.63	0.49
	Oct-10					23.04	127.42	-0.21

Table 1. MONITORING WELL GROUNDWATER ELEVATION DATA

June 2007 through July 2010

Sierra Nevada Cheese Company, Willows, California

Well Number	Date Measured	Top of Casing Elevation (feet msl)	Total Depth [a] (feet bgs)	Bottom of Well Elevation (feet msl)	Screened Interval (feet msl)	Depth to Groundwater [b] (feet below TOC)	Groundwater Elevation (feet msl)	Change From Previous (feet)
MW-3	Jun-07	143.39	28.0	115.39	135.39 - 115.39	14.10	129.29	
	Sep-07					15.50	127.89	-1.40
	Jan-08					15.50	127.89	0.00
	Apr-08					13.30	130.09	2.20
	Sep-08					DRY		
	Nov-08					DRY		
	Jan-09					DRY		
	Apr-09					16.68	126.71	
	Jul-09					16.83	126.56	-0.15
	Oct-09					21.90	121.49	-5.07
	Jan-10					11.42	131.97	10.48
(d)	Apr-10					DRY		
	May-10					15.54	127.85	
	Jun-10					10.04	133.35	5.50
	Jul-10					12.75	130.64	-2.71
	Aug-10					14.40	128.99	-1.65
	Sep-10					16.20	127.19	-1.80
	Oct-10					18.27	125.12	-2.07

Table 1. MONITORING WELL GROUNDWATER ELEVATION DATA

June 2007 through July 2010

Sierra Nevada Cheese Company, Willows, California

Well Number	Date Measured	Top of Casing Elevation (feet msl)	Total Depth [a] (feet bgs)	Bottom of Well Elevation (feet msl)	Screened Interval (feet msl)	Depth to Groundwater [b] (feet below TOC)	Groundwater Elevation (feet msl)	Change From Previous (feet)
MW-4	Jun-07	141.82	24.60	118.79	137.32 - 117.32	14.10	127.72	
	Sep-07					12.30	129.52	1.80
	Jan-08					12.30	129.52	0.00
	Apr-08					7.10	134.72	5.20
	Sep-08					14.00	127.82	-6.90
	Nov-08					16.80	125.02	-2.80
	Jan-09					16.00	125.82	0.80
	Apr-09					15.50	126.32	0.50
	Jul-09					22.79	119.03	-7.29
	Oct-09					18.48	123.34	4.31
	Jan-10					8.42	133.40	10.06
(d)	Apr-10					11.08	130.74	-2.66
	May-10					13.56	128.26	-2.48
	Jun-10					9.71	132.11	3.85
	Jul-10					12.00	129.82	-2.29
	Aug-10					12.93	128.89	-0.93
	Sep-10					13.00	128.82	-0.07
	Oct-10					10.84	130.98	2.16

** - No data collected, or dry well

bgs - below ground surface

msl - above mean sea level

TOC- top of casing (TOC is the outer locking stovepipe casing)

(a) Total depth and screen intervals are based on monitoring well logs (Taber Consultants, May 7, 1990)

(b) Depth to groundwater measured by Sierra Nevada Cheese Company

(c) Data is considered to be erroneous. The area was flooded and surface water is suspected to have entered through the top of the well artificially raising the depth to groundwater.

(d) Depth to groundwater measured using an electronic sounding probe beginning April 2010. Subsequent groundwater level data is also measured by an electronic sounding probe.

Table 2. GROUNDWATER FLOW DIRECTION AND GRADIENT

June 2007 through July 2010

Sierra Nevada Cheese Company, Willows, California

Date Measured	Groundwater Flow Direction	Hydraulic Gradient (ft/ft)
Jun-07*	S 1° W	0.002
Sept-07*	S 66° E	0.002
Jan-08*	S 66° E	0.002
Apr-08*	N 68° E	0.003
Sep-08	Not Measureable	Not Measureable
Nov-08	Not Measureable	Not Measureable
Jan-09	Not Measureable	Not Measureable
Apr-09* Apr-09** Apr-09***	S 16° E N 63° E N 29° W	0.001 0.002 0.008
Jul-09***	N 61° W	0.008
Oct-09**	N 82° E	0.013
Jan-10*	N 9° W (4,3,2)	0.003
Apr-10	Not Measureable	Not Measureable
May-10* May-10** May-10***	S 45° E (4,3,2) N 65° E (1,3,2) N 23° W (1,4,3)	0.001 0.002 0.005
Jun-10* Jun-10** Jun-10***	N 68° W (4,3,2) S 80° W (1,3,2) S 10° E (3,4,1)	0.001 0.002 0.003
Jul-10* Jul-10** Jul-10***	N 85° W (4,3,2) S 64° W (1,3,2) S 20° E (3,4,1)	0.001 0.002 0.004

NOTES: * wells MW-2, MW-3, MW-4

** wells MW-1, MW-2, MW-3

*** wells MW-1, MW-3, MW-4

Table 3. GROUNDWATER MONITORING WELL ANALYTICAL R

June 2007 through July 2010

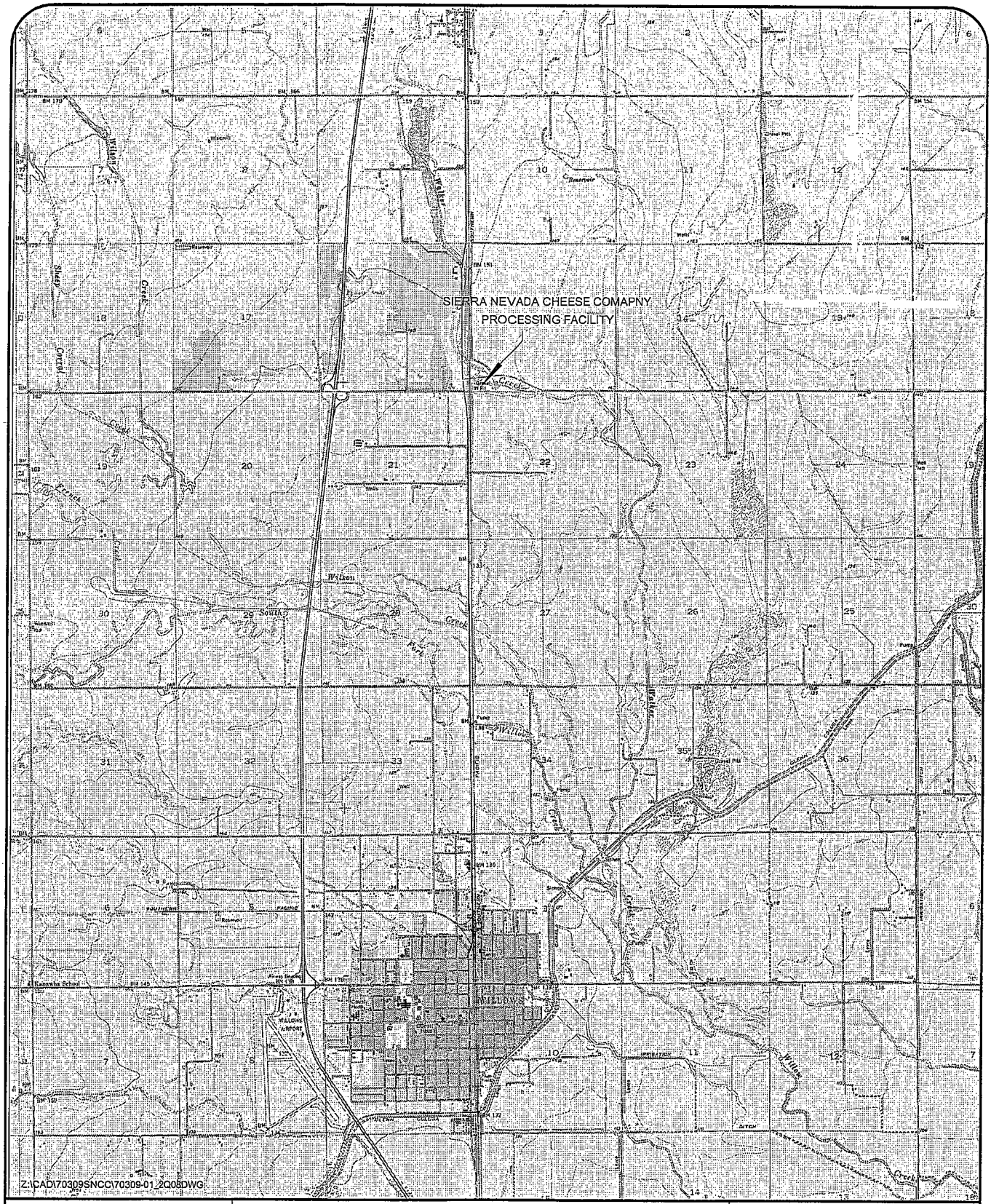
Sierra Nevada Cheese Company, Willows, California

Well Number	Sample Date	pH (pH units)	EC (µmhos/cm)	BOD (mg/L)	Ammonia as NH3 (mg/L)	Carbonate (mg/L)	Hardness (mg/L)
MW-1	Mar-07	NS	NS	NS	NS	NS	NS
	Jun-07	NS	NS	NS	NS	NS	NS
	Sep-07	NS	NS	NS	NS	NS	NS
	Jan-08	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS
	Sep-08	6.9	646	<2.0	<0.2	<10	195
	Nov-08	6.96	605	<2.0	<0.2	<10	211
	Jan-09	6.98	734	4.05	0.8	<10	326
	Apr-09	7.00	474	<2.0	<0.2	<10	199
	Jul-09	6.85	530	1.81	<0.2	<10	392
	Oct-09	6.85	596	8	<0.2	<10	1140
	Jan-10	7.29	546	<2.0	0.4	<10	48.8
	Apr-10	7.19	498	<2.0	<0.2	<10	216
	Jul-10	6.39	509	1.3	<0.2	<10	225
	Oct-10	6.21	456	9.93	<0.2	<10	303
MW-2	Mar-07	6.36	604	NA	NA	<10	227
	Jun-07	6.98	504	<2.0	NA	<10	177
	Sep-07	7.3	514	NA	NA	<10	189
	Jan-08	7.3	569	NA	NA	<10	213
	Apr-08	6.56	514	<2.0	0.9	<10	210
	Sep-09	NS	NS	NS	NS	NS	NS
	Nov-09	NS	NS	NS	NS	NS	NS
	Jan-09	NS	NS	NS	NS	NS	NS
	Apr-09	7.11	550	<2.0	<0.2	<1.0	240
	Jul-09	NS	NS	NS	NS	NS	NS
	Oct-09	NS	NS	NS	NS	NS	NS
	Jan-10	6.97	560	<2.0	<0.2	<10	260
	Apr-10	7.02	553	<2.0	<0.2	<10	257
	Jul-10	6.4	504	0.6	0.2	<10	212
	Oct-10	6.27	492	<2.0	0.2	<10	366
MW-3	Mar-07	6.5	795	NA	NA	<10	317
	Jun-07	6.74	603	NA	NA	<10	286
	Sep-07	6.95	650	<2.0	NA	<10	296
	Jan-08	6.95	633	NA	<0.2	<10	85
	Apr-08	6.24	650	3.7	<0.2	<10	150
	Sep-09	NS	NS	NS	NS	NS	NS
	Nov-09	NS	NS	NS	NS	NS	NS
	Jan-09	NS	NS	NS	NS	NS	NS
	Apr-09	7.06	542	<2.0	<0.2	<10	231
	Jul-09	6.93	471	6.53	<0.2	<10	1020
	Oct-09	6.93	492	47.6	<0.2	<10	11400
	Jan-10	6.98	292	8.56	<0.2	<10	138
	Apr-10	7.11	544	2.00	<0.2	<10	146
	Jul-10	6.34	483	1.20	<0.2	<10	184
	Oct-10	5.97	610	1.20	<2.0	<10	369
MW-4	Mar-07	6.53	650	NA	NA	<10	224
	Jun-07	6.68	653	NA	NA	<10	258
	Sep-07	7.04	474	<2.0	NA	<10	143
	Jan-08	7.04	712	NA	NA	<10	279
	Apr-08	6.5	474	<2.0	0.2	<10	243
	Sep-08	6.92	644	<2.0	<0.2	<10	253
	Nov-08	6.76	953	<2.0	0.7	<10	436
	Jan-09	6.96	934	<2.0	<0.2	<10	365
	Apr-09	7.19	413	<2.0	<0.2	<10	186
	Jul-09	6.87	674	1.63	<0.2	<10	392
	Oct-09	6.74	717	<2.0	<0.2	<10	551
	Jan-10	6.70	712	<2.0	<0.2	<10	247
	Apr-10	7.23	712	<2.0	<0.2	<10	317
	Jul-10	6.28	518	1.2	<0.2	<10	177
	Oct-10	6.18	503	2.2	0.3	<10	249

NOTES:
BOD - biological oxygen demand at 20°C
EC - electrical Conductivity
FDS - dixed dissolved solids
mg/L - milligrams per liter (parts per million)
NA - not analized
ND - not detected
NS - not sampled
TDS - total dissol

FIGURES

1. Site Location
2. Site Layout and Proposed Monitoring Well Locations
3. Historical Groundwater Elevations



HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
8 SEVILLE COURT, SUITE 100
CHICO, CA 95928
(530) 894-2487 FAX 894-2437

SITE LOCATION MAP

Sierra Nevada Cheese Company

GLENN COUNTY, CALIFORNIA

PROJ NO.: 70309-03

DATE: JUNE, 2011

FIGURE NO.: 1

LEGEND

MW-2 — MONITORING WELL LOCATION IDENTIFICATION

MW-5 — PROPOSED MONITORING WELL LOCATION IDENTIFICATION

NO ACCESS OR AREA NOT ACCESSIBLE WITH DRILL RIG

Z:\CAD\70309SNCC\70309-01_2Q08DWG

HOLDREGE & KULL
CONSULTING ENGINEERS · GEOLOGISTS
8 SEVILLE COURT, SUITE 100
CHICO, CA 95928
(530) 894-2487 FAX 894-2437

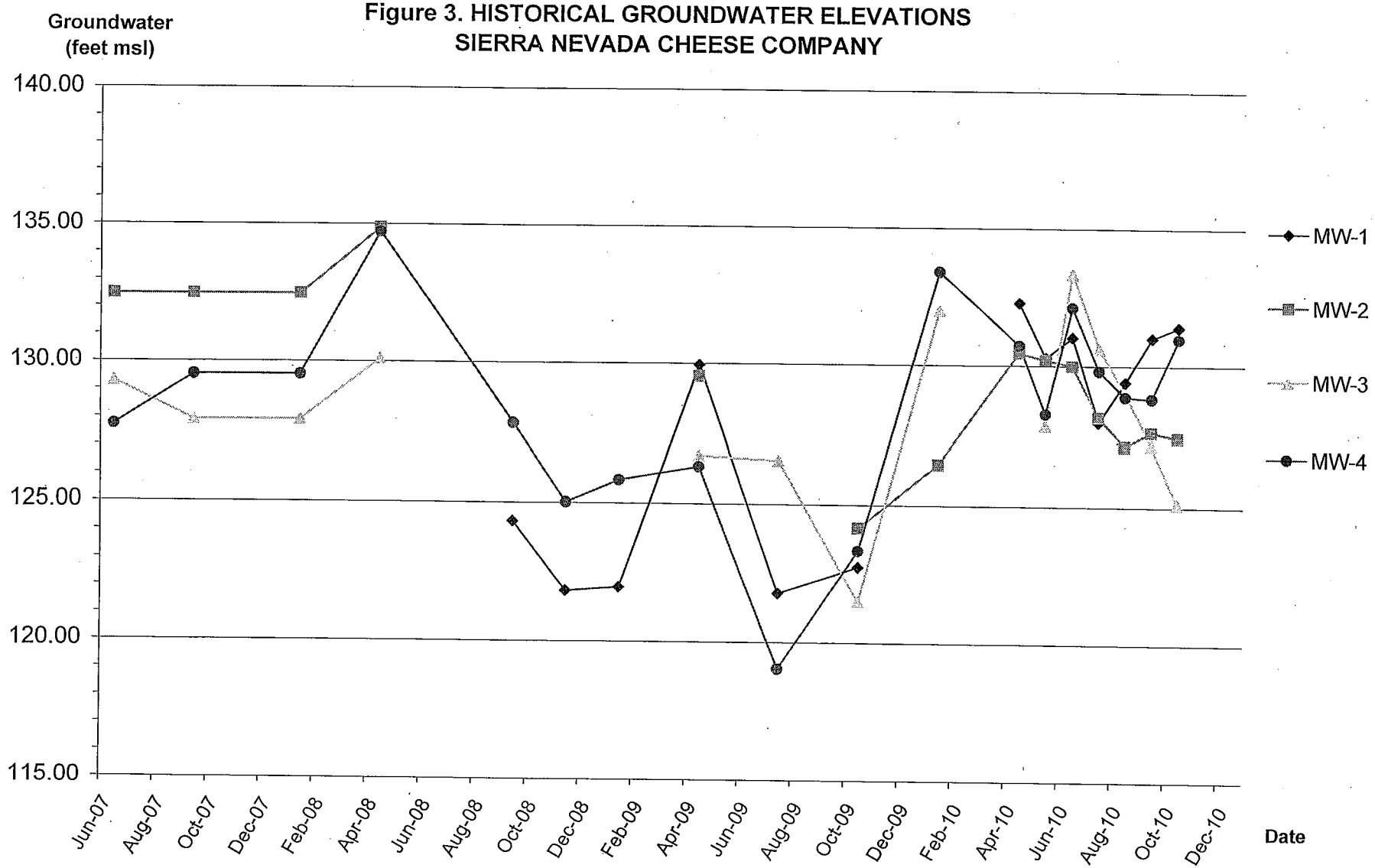
SITE LAYOUT & PROPOSED
MONITORING WELL LOCATIONS
Sierra Nevada Cheese Company
GLENN COUNTY, CALIFORNIA

PROJ NO.: 70309-01

DATE: JUNE. 2011

FIGURE NO.: 2

Figure 3. HISTORICAL GROUNDWATER ELEVATIONS
SIERRA NEVADA CHEESE COMPANY



Z:\PROJECT\70309\MW Network Assessment\70309-03_110810

ATTACHMENT A

Regional Water Quality Control Board Letter
8 March 2010

Linda S. Adams
Secretary for Environmental Protection

California Regional Water Quality Control Board
Central Valley Region

Katherine Hart, Chair

415 Knollcrest Drive, Suite 100, Redding, California 96002
(530) 224-4845 • Fax (530) 224-4857
http://www.waterboards.ca.gov/centralvalley

Arnold Schwarzenegger
Governor

8 March 2010

Mr. Ben Gregerson, Owner
Sierra Nevada Cheese Company
6505 County Road 39
Willows, Ca 95988

REVIEW OF WATER QUALITY ASSESSMENT REPORT AND 2009 FLOW DIRECTIONS AND HYDRAULIC GRADIENTS REPORT AND REQUEST FOR ENGINEERING REPORT, SIERRA NEVADA CHEESE COMPANY, ORDER NO. R5-2007-0043, WILLOWS, GLENN COUNTY

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff has reviewed the *Water Quality Assessment Report* (Report) submitted on 23 December 2009 and the *2009 Groundwater Flow Directions and Hydraulic Gradients* (Annual Report) submitted on 2 February 2010.

The calculated flow directions and hydraulic gradients varied significantly each quarter. The Report stated, "The calculated hydraulic gradient ranges from 0.001 to 0.008 feet per feet. These gradients are very flat; therefore, a slight increase or decrease (as little as 0.01 feet) in the measurement of the depth to groundwater can drastically change the calculated flow direction." In July 2008, the Central Valley Water Board approved a *Flow Measurement and Groundwater Monitoring Plan* that implemented the use of a retractable measuring tape and chalk to obtain depth to groundwater; due to the flat groundwater gradients and the necessity for depth measurements accurate to 0.01 feet, the Central Valley Water Board requests that you obtain and utilize a well sounder (accurate to 0.01 feet) to obtain groundwater depths **by May 2010**. In addition, the Regional Water requests that groundwater depths be obtained **monthly**, starting in May 2010. The ability to obtain accurate depths to groundwater with greater frequency will allow you and your consultant to determine an accurate groundwater gradient and direction. The Report included a recommendation that the Monitoring and Reporting Program (MRP) be evaluated to determine if it is appropriate; the Central Valley Water Board has determined that the MRP is appropriate and a groundwater monitoring reduction will not be granted at this time.

The Annual Report included conflicting information regarding October 2009 groundwater direction and gradient; the direction and gradient was reported as North 82° West and 0.008 ft/ft (page 2) and North 82° East and 0.013 ft/ft (figure 5). Please provide the correct groundwater direction and hydraulic gradient for October 2009.

Data presented in the Report and Annual Report for monitoring well 3 (MW-3) showed spikes in the standard minerals that coincided with agricultural practices in the area; MW-3 is located in a rice field, which is flooded during the irrigation season.

Therefore, the Central Valley Water Board requests that your consulting engineer or geologist submit a report that will assess the ability of the existing monitoring well network to monitor potential groundwater impacts from the wastewater ponds. At a minimum, the report should include discussions and recommendations regarding the following: continued sampling of MW-3, existing wells that need redevelopment, the water bearing unit of each well, seasonal groundwater impacts from irrigation practices and Walker Creek, wells that should be abandoned, and installation of additional wells to capture potential wastewater releases south of the wastewater ponds. The report must be submitted to this office **by 1 September 2010.**

If you have any questions regarding the above comments or requested report, please contact me at (530) 224-3249 or at the letterhead address.

Jacqueline Matthews
Environmental Scientist

JMM: knr

cc: Shane Cummings, Holdredge and Kull, Chico
Glenn County Environmental Health, Willows

U:\Clerical\South\JMatthews\2010\snc_gw_reports_18feb10.doc

ATTACHMENT B

Monitoring Well Logs (Taber, 1990)

TABER
SINCE 1954
TABER CONSULTANTS
Engineers & Geologists

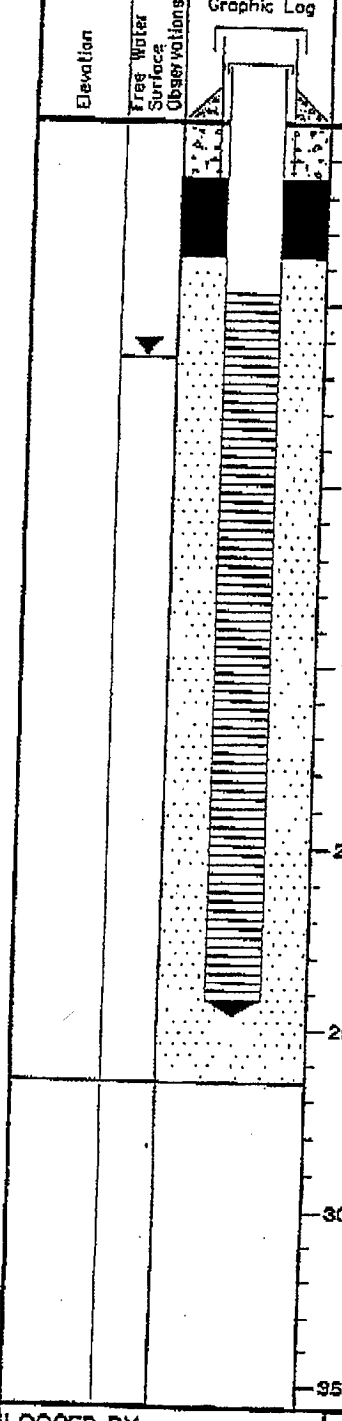
MONITORING WELL LOG

Job No.: 2P2/389/11-2

Project Name: Glenn Milk Producers Waste Water Ponds

Client: Glenn Milk Producers

WELL CASING: 4" Diameter PVC	FROM 24.7 TO 0 ft.	Well No. 1	Location: See Plan
TYPE OF PERFORATION: .020" Machine slotted	FROM 24.7 TO 4.7 ft.	Elevation: E.G.S.	Reference: General Plan 1"=600'
SIZE AND TYPE OF FILTER: #2 Sand	FROM 26.5 TO 3.7 ft.	Drilling Equipment: MOBILE B-53	
TYPE OF SEAL NO. 1 Bentonite Chips	FROM 3.7 TO 1.7 ft.	Drilling Method: 8" & 10" Hollow Stem Auger	
NO. 2 Lean Cement	FROM 1.7 TO 0 ft.	Notes: 8" locking well sleeve placed over 4" PVC Casing cap	



REMARKS (drill rate, fluid loss, odor, etc.)

Drilled and sampled with 8" hollow stem auger, redrilled with 10" hollow stem auger before installation of 4" PVC

SOIL TESTS	BLOWS/FOOT 350 ft lb.	SAMPLE SIZE (inches)	SAMPLE No.
	40	2.0	1
	21	2.0	2
	33	2.0	3
	39	2.0	4
	42	2.0	5

DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
0	GM		Very stiff orange brown GRAVELLY SILT
5	GW		Dense brown gray fine to coarse GRAVEL
10	CL		Very stiff brown SILTY CLAY/CLAYEY SILT
20	CL		Hard orange gray brown SANDY SILTY CLAY
25	SM		Hard orange gray brown SAND
30			
35			

LOGGED BY: M.P.D. CHECKED BY: D.A.D. DATE: 5-7-90

FIGURE 1 Page 1 of 4

TABER CONSULTANTS
SINCE 1954
Engineers & Geologists

MONITORING WELL LOG

Project Name: Glenn Milk Producers Waste Water Ponds
Job No.: 2P2/389/11-2
Client: Glenn Milk Producers

WELL CASING: 4" Diameter PVC FROM 25.0 TO 0 ft.
TYPE OF PERFORATION: .020" Machine slotted FROM 25.0 TO 5.0 ft.
SIZE AND TYPE OF FILTER: #2 Sand FROM 26.5 TO 3.5 ft.
TYPE OF SEAL: NO. 1 Bentonite Chips FROM 3.5 TO 1.5 ft.
NO. 2 Lean Cement FROM 1.5 TO 0 ft.

Well No. 2
Elevation: E.G.S.
Drilling Equipment: MOBILE B-53
Drilling Method: 8" & 10" Hollow Stem Auger
Notes: 8" locking well sleeve placed over 4" PVC Casing cap
Location: See Plan
Reference: General Plan 1"=600'

Elevation	Free Water Surface Observations	Graphic Log	Depth (feet)	Geologic Unit	REMARKS (drill rate, fluid loss, odor, etc.)	SOIL TESTS	BLOWS/FOOT 350 ft lb.	SAMPLE SIZE (inches)	SAMPLE No.	DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
			5		Drilled and sampled with 8" hollow stem auger, redrilled with 10" hollow stem auger before installation of 4" PVC		98	2.0	1	5		ML	Very hard brown slightly CLAYEY SANDY SILT
			10				140+	2.0	2	10		GM	Dense brown SILTY GRAVEL
			15				93	2.0	3	15		GW	Very dense gray brown very fine to coarse slightly SILTY GRAVEL
			20				68	2.0	4	20			
			25				70	2.0	5	25		CL	Very hard SILTY CLAY with very fine to fine scattered GRAVEL
			30							30			
			35							35			

LOGGED BY: M.P.D. CHECKED BY: D.A.D. DATE: 5-7-90

FIGURE 1 Page 2 of 4

TABER CONSULTANTS
SINCE 1954
Engineers & Geologists

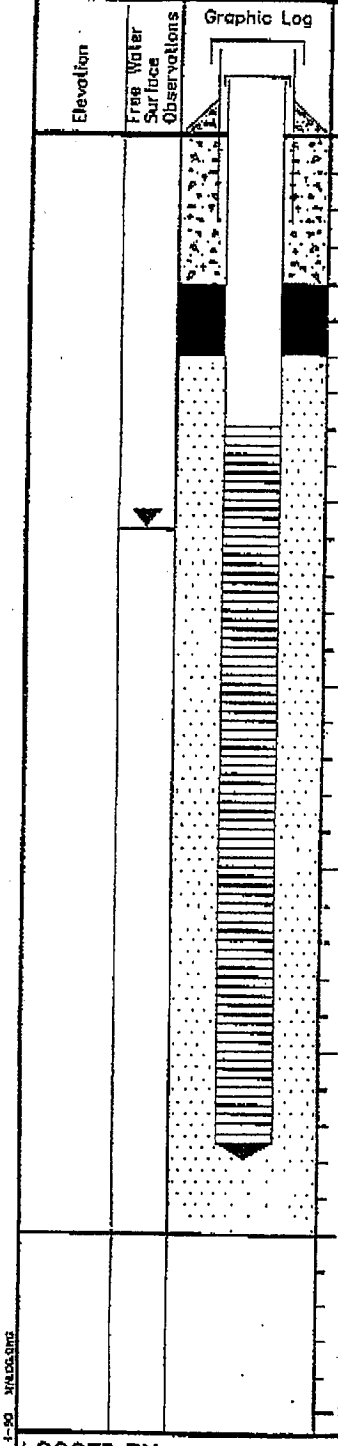
MONITORING WELL LOG

Job No.: 2P2/389/11-2

Project Name: Glenn Milk Producers Waste Water Ponds

Client: Glenn Milk Producers

WELL CASING: 4" Diameter PVC	FROM 28.0 TO 0 ft.	Well No. 3	Location: See Plan
TYPE OF PERFORATION: .020" Machine slotted	FROM 28.0 TO 8.0 ft.	Elevation: E.G.S.	Reference: General Plan 1"=600'
SIZE AND TYPE OF FILTER: #2 Sand	FROM 30.0 TO 6.0 ft.	Drilling Equipment: MOBILE B-53	
TYPE OF SEAL NO. 1 Bentonite Chips	FROM 6.0 TO 4.0 ft.	Drilling Method: 8" & 10" Hollow Stem Auger	
NO. 2 Lean Cement	FROM 4.0 TO 0 ft.	Notes: 8" locking well sleeve placed over 4" PVC Casing cap	



REMARKS (drill rate, fluid loss, odor, etc.)	SOIL TESTS	BLOWS/FOOT 350 ft lb.	SAMPLE SIZE (inches)	SAMPLE No.
Drilled and sampled with 8" hollow stem auger, redrilled with 10" hollow stem auger before installation of 4" PVC.		63	2.0	1
		110+	2.0	2
		110+	2.0	3
		75	2.0	4
Drilled to 30 ft due to cuttings inside hollow stem auger at 25 ft.		18	2.0	5

DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
5		ML	Hard light tan brown to buff SANDY SILT
10		GM	Very dense gray brown SILTY SANDY GRAVEL
15		GM	Very dense gray fine to medium SANDY GRAVEL
20		CL	Very hard red brown SILTY CLAY
25		CL	Stiff red brown SILTY CLAY with scattered GRAVEL
30			
35			

REV. 1-90 XYLOS.DWG

LOGGED BY: M.P.D. | CHECKED BY: D.A.D. | DATE: 5-7-90

FIGURE 1 Page 3 of 4

TABER CONSULTANTS
SINCE 1954
Engineers & Geologists

MONITORING WELL LOG

Job No.: 2P2/389/11-2

Project Name: Glenn Milk Producers Waste Water Ponds

Client: Glenn Milk Producers

WELL CASING: 4" Diameter PVC	FROM 24.6 TO 0 ft	Well No. 4	Location: See Plan
TYPE OF PERFORATION: .020" Machine slotted	FROM 24.6 TO 4.6 ft	Elevation: E.G.S.	Reference: General Plan 1"=600'
SIZE AND TYPE OF FILTER: #2 Sand	FROM 26.5 TO 3.6 ft	Drilling Equipment: MOBILE B-53	
TYPE OF SEAL NO. 1 Bentonite Chips	FROM 3.6 TO 1.6 ft	Drilling Method: 8" & 10" Hollow Stem Auger	
NO. 2 Lean Cement	FROM 1.6 TO 0 ft	Notes: 8" locking well sleeve placed over 4" PVC Casing cap	

Elevation	Free Water Surface Observations	Graphic Log	Depth (feet)	Geologic Unit	REMARKS (drill rate, fluid loss, odor, etc.)	SOIL TESTS	BLOWS/FOOT 350 ft lb.	SAMPLE SIZE (inches)	SAMPLE No.	DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
			5		Drilled, sampled and installed 4" PVC with 8" hollow stem auger		34	2.0	1	5		ML	Very stiff brown SANDY SILT
			10				63	2.0	2	10		GW	Compact fine to coarse SILTY GRAVEL
			15				40	2.0	3	15		CL	Very stiff/hard gray brown SILTY CLAY
			20				69	2.0	4	20		CL	Hard gray brown SANDY CLAY
			25				81	2.0	5	25		CL	Very hard gray brown SILTY CLAY
			30							30			
			35							35			

LOGGED BY: M.P.D. CHECKED BY: D.A.D. DATE: 5-7-90

FIGURE 1 Page 4 of 4

REV. 4-90 UYBOOLDWG

ATTACHMENT C

Work Plan

WORK PLAN

This work plan summarizes the proposed field activities for groundwater monitoring well installation at the Sierra Nevada Cheese Company (SNCC) located at 6505 County Road 39 in Willows, Glenn County, California

The activities proposed for this field effort will be performed in accordance with the Site Safety Plan (SSP), included as Annex A, which identifies site-specific hazards and safety measures to be implemented by Holdrege & Kull (H&K) personnel.

1.1 Purpose and Scope

This work plan describes the various activities associated with the installation of three groundwater monitoring wells. The new monitoring wells (MW-5, MW-6, and MW-7) are being installed to obtain additional flow and chemical data needed to better define the aquifer underlying SNCC.

The scope of work to be performed includes the following:

- Drill, construct, and develop three groundwater monitoring wells.
- Collect groundwater samples from the three new monitoring wells in accordance with Monitoring and Reporting Program (MRP) R5-2007-0043.
- Generate a field summary report (FSR) to document field activities conducted for, drilling, well construction, and well development.

Pre-Field Activities

Prior to the start of field activities, H&K will conduct the following:

- Obtain required drilling/monitoring well permits from Glenn County Division of Environmental Health; and
- Notify underground service alert (USA) to conduct a utility clearance at the four proposed drilling/monitoring well locations at least 72 hours in advance of field activities.

Drilling, Well Construction, and Development

A total of three soil borings will be drilled one for each monitoring well to approximate maximum depths of 30 (MW-5), 30 (MW-6), and 30 (MW-7) feet bgs. Proposed monitoring well construction details and rationale are presented in Table C-1. The total depths and screen intervals in Table C-1 are subject to change based on actual field data. The final well construction details (i.e., total depth and screen interval) will be determined by the field geologist and the H&K project manager/professional geologist.

TABLE C-1. Proposed Monitoring Well Construction Details

Well Name	Total Depth (feet bgs)	Screen Interval (feet bgs)	Rationale
MW-5	30	20–30	Replacement of MW-3 down gradient of Ponds 4and 5. Needed for additional flow and chemical data.
MW-6	25	15–25	Upgradient monitoring well needed for additional flow and chemical data.
MW-7	25	15–25	Downgradient monitoring well needed for additional flow and chemical data.

bgs = below ground surface

Drilling. The three new borings will be drilled with a hollow stem auger (HSA) drill rig equipped with 9-inch augers. Soil cuttings and groundwater will travel up the annulus of the borehole to the ground surface. Soil cuttings will be disposed by spreading the cuttings on site. Monitoring wells will be constructed inside the augers. The annulus between the well casing and augers will act as a tremie for filter pack sand, bentonite, and grout.

Well Construction. Each monitoring well shall be constructed of 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) casing (10 to 20 feet per boring) and 0.020-inch slotted PVC screen (10 feet per boring). Lonestar No. 3 (or equivalent) sand filter pack shall be used for each screen interval and will be placed to an elevation of 2 feet above the top of the well screen. After placement of the filter pack, the subcontractor shall surge the screen interval until the filter pack has sufficiently settled, as determined by a URS geologist. A 1-foot sand bridge of Monterey #0/30 sand (or equivalent) will be added on top of each filter pack. After placement of the sand bridge, a minimum 2-foot-thick bentonite seal will be installed in each monitoring well to protect the filter pack during grout placement. The bentonite pellets or chips will be placed onto the top of the support sand so as to prevent bridging of the pellets in the annular space. The pellets will be allowed to hydrate in accordance with the manufacturer's recommendations, prior to grout placement.

Grout emplacement for each monitoring well shall be accomplished by pumping a neat cement mixture of Type II Portland cement with 3 pounds of powdered nonbeneficiated bentonite and 7 gallons of water per 94-pound sack of cement. Grout shall be pumped through a 1- or 2-inch-diameter tremie pipe placed inside the augers. No more than 10 to 15 feet of augers shall be recovered in any one recovery. Every effort shall be made to keep grout from falling below the bottom of the augers at any point during grouting operation. Grout will be pumped to within approximately 1 foot bgs. The remaining 1 foot will be backfilled with native soil, flush with the existing grade. Surface completions for each monitoring well will be aboveground, lockable steel security casings. Following completion of the groundwater monitoring wells, and when the grout has set for a minimum of 72-hours, the three monitoring wells will be developed.

Well Development. Well development will be accomplished by swabbing and bailing followed by pumping. At a minimum, the following steps will be executed:

1. A sand bailer or similar device will be used to remove sand or fine material from the bottom of the well; the well will be bailed until less than 1 teaspoon of sand or fine material is collected in the bailer.
2. The well will then be swabbed with a 2-inch valved surge block. The swabbing will begin just below the static water level in the casing, with a gentle action, until free movement of water through the screen is assured, at which time surging can progress more actively.
3. The surge block will then be lowered gradually into the screened area(s). The amount of material drawn into the well will be measured frequently and will be removed by frequent bailing with a sand bailer.
4. Repeat steps 1 through 3 at least three times or until less than 1 teaspoon of sand or fine material is collected in the bailer.
5. Upon completion of swabbing and bailing, the well will be pumped using a submersible pump. The wells will be pumped at variable flow rates and drawdown will be observed.
6. Turbidity, pH, temperature, and specific conductivity will be measured throughout the development process; measurements will be taken more frequently (e.g., approximately every five minutes) at the beginning stages of development until stabilization has occurred. The frequency for taking measurements will be determined in the field based on production rate.

When each of the following parameters has stabilized during sustainable flow rate, and three consecutive measurements do not differ by more than the limits specified below, well development will be considered complete. If these limits cannot be achieved, then a new well development method or approach may be proposed. The well development stabilization criteria are:

- pH: ±0.2 units;
- Specific conductivity: ±10.0%;
- Temperature: ±1 degree Celsius (°C); and
- Turbidity: < 10 nephelometric turbidity units (NTUs).

Waste Handling. Drilling, well installation, and development activities are expected to generate soil cuttings and purge water. Both will be disposed on site: soil will be spread out, and water will be disposed in Pond 1.

Groundwater Sampling. The newly installed monitoring wells will be sampled accordance with RWQCB Monitoring and Reporting Program (MRP) R5-2007-0043 during the next regularly scheduled sampling event.

Reporting

After field activities are concluded, a Field Summary Report will be generated summarizing soil boring abandonment, drilling, well construction, and well development. The FSR will include California Department of Water Resources Well Driller's Logs, lithologic logs, well construction diagrams, copies of field data sheets for well development and soil boring abandonment, and other data deemed pertinent by the project geologist.

Annex A

Site Safety Plan

ANNEX A

SITE SAFETY PLAN
for
GROUNDWATER MONITROING WELL INSTALLATION
at
Sierra Nevada Cheese Company
6050 County Road 39
Willows, California

Prepared by:
Holdrege & Kull
8 Seville Court, Suite 100
Chico, California 95928

Project No. 70309-03
June 2011

TABLE OF CONTENTS

FIGURES

APPENDIX

1 INTRODUCTION

Holdrege & Kull (H&K) prepared this task specific Site Safety Plan (SSP) for observation of borehole drilling, monitoring well construction, well development, and groundwater sampling at Sierra Nevada Cheese Company (SNCC) at 6505 County Road 39, Willows, California. Drilling and well construction is to be performed by others under a separate SSP. This SSP was prepared for H&K employees in accordance with guidelines set forth in the California Hazardous Waste Operations Standard, Section 5192 of Title 8 of the Code of California Regulations (8 CCR 5192); the Hazardous Communications Standard, 8 CCR 5194; OSHA's Safety and Health Standard of Title 29 of the Code of Federal Regulations (29 CFR 1910.120, 29 CFR 1926).

The purpose of this SSP is to establish safe procedures and practices for H&K employees engaged in field activities associated with drilling and sampling activities at the site. This SSP is for employees of H&K. However, it will be read and signed by site visitors and subcontractors prior to work associated with site remediation and sampling.

The health and safety guidelines and requirements presented herein are based on a review of available information and an evaluation of potential hazards. The plan describes the health and safety procedures and equipment required for observation of well construction and development of the wells and groundwater monitoring in order to minimize the potential for exposures to field personnel. Should circumstances during the course of field work be extraordinarily different than anticipated, field work shall be temporarily stopped, so that potential hazards can be evaluated and appropriate health and safety precautions implemented.

It is not possible in advance to discover, evaluate and protect against all possible hazards which may be encountered. Adherence to the requirements of this SSP will significantly reduce, but not eliminate, the potential for occupational injury and illness at the project site.

The provisions of this SSP will be implemented by H&K personnel. All contractors, subcontractors and other visitors are responsible for their own health and safety. However, all H&K subcontractors are to comply with the requirements of this SSP at a minimum. Subcontractors are to develop their own SSP which addresses all anticipated hazards associated with their scope of work.

Section 2 of this SSP describes the site location and field activities. Section 3 presents the key personnel for this task. Section 4 provides a description of the known site hazards and procedures for protecting workers. Section 5 specifies routine and special training for this task. Section 6 discusses the levels of personal protection. Section 7 discusses medical surveillance requirements. Section 8 discusses the delineation of work areas and site access control. Section 9 contains the decontamination procedures. Section 10 presents references.

2 BACKGROUND AND SETTING

Approximately 95,000 gallons of milk are processed monthly to produce varieties of cheese, yogurt, butter, and sour cream. The addition of salt to the curd occurs after the whey has been drained, therefore avoiding the generation of high saline waters being discharged to the wastewater ponds. Two waste streams are produced during the production: process wastewater and non-contact cooling water. The process water is mainly whey waters generated during the cheese production as well as wash water used to clean equipment. Cooling water is supplied from the on-site water well and used to cool the compressor and culture vats. The cooling water effluent is similar to the water quality of the regional groundwater when discharged.

There are a total of seven unlined wastewater ponds with approximately 201 million gallons of capacity available for treating effluent wastewater by providing aeration, biological degradation, settling, and percolation through the soil. Based on the current facility use and production, an average annual waste of 7.8 million gallons is discharged to the ponds. The wastewater is primarily discharged to three unlined wastewater ponds (Pond 1, Pond 2, and Pond 3) with a total capacity of 16.1 million gallons and periodically discharged to Ponds 4 and 5 during the rainy season.

There are currently four groundwater monitoring wells at the site that are used for monitoring the quality of groundwater in the aquifer beneath the wastewater ponds. Due to data gaps and the inability of the monitoring well network to meet the requirements of the Regional Water Quality Control Board Waste Discharge Requirements for monitoring, three new groundwater monitoring wells are being constructed at the site.

2.1 FIELD ACTIVITIES

H&K's activities will include observation of drilling and well construction; development of the wells; and collection of groundwater samples from the wells. We anticipate that drilling will be performed by auger or rotary methods to a maximum depth of 30 feet below the ground surface. The 2-inch diameter

monitoring wells will be constructed and developed by others and H&K will be collecting groundwater samples during the development process.

3 KEY PERSONNEL AND RESPONSIBILITY

3.1 H&K CHAIN OF COMMAND

Mr. Shane D. Cummings, C.H.G., is the Project Manager. Ms. Heidi Cummings, P.G. may perform field work and act as site safety officer (SSO). Other H&K staff may also perform sampling and observation. The SSO has the authority to monitor and correct health and safety problems as noticed on site. The project field staff have completed 40 hours of comprehensive health and safety training which meets the requirements of 8 CCR 5192 and 29 CFR 1910.120. The SSO will make this SSP available to each member of the H&K field team, subcontractors and site visitors.

The project staff is responsible for ensuring that all data acquisition is performed in accordance with the project workplan and SSP, and that deviations from the plans are based upon field conditions encountered and are well documented in the field notes. The field team's health and safety responsibilities include:

1. Following the SSP;
2. Reporting any unsafe conditions or practices to the SSO;
3. Reporting all facts pertaining to incidents which result in injury or exposure to toxic materials to the SSO;
4. Reporting equipment malfunctions or deficiencies to the SSO.

The SSO has on-site responsibility for ensuring that each of the field team members, including H&K personnel, comply with the SSP. It is the SSO's responsibility to inform the subcontractors and other field personnel when chemical and physical hazards arise. Additional SSO responsibilities include:

1. Providing site safety briefing for team members;
2. Updating equipment or procedures to be used on site based on new information gathered during the site investigation;

3. Inspecting all personal protective equipment to be used by H&K or subcontractors to H&K;

4. Assisting the Project Manager by documenting compliance with the SSP by completing employee and subcontractor SSP acknowledgment forms (Appendix A);

5. Evaluating the effectiveness of field decontamination procedures for personnel, protective equipment, sampling equipment and containers, and heavy equipment and vehicles;

6. Discussing with H&K personnel the location and route to the nearest medical facility and arranging for emergency transportation to the nearest medical facility;

7. Discussing with H&K personnel the telephone numbers of local public emergency services (e.g., police and fire);

8. Reporting injuries and/or illnesses using the accident report form (Appendix B); and

9. Stopping operations that threaten the health and safety of the field team and/or surrounding populace.

3.2 SUBCONTRACTOR PERSONNEL RESPONSIBILITIES

All subcontractors are responsible for their own SSP. A written SSP must be available for County of Glenn review if requested.

3.3 VISITORS

Visitors to the work areas are responsible for their own health and safety, but will be provided with a copy of this SSP to read and sign. Following is a list of project contacts.

Mr. Shane D. Cummings, C.H.G. (H&K) Project Manager	Office: 530-894-2487 Mobile: 530-362-0142
Ms. Heidi Cummings, P.G. (H&K) Project Geologist/SSO	Office: 530-894-2487 Mobile: 530-864-6971

Ms. Kathy Gallego, (SNCC) Office: 530-934-8660

4 HAZARD EVALUATION

The potential hazards to personnel working at this site have been identified as physical. Each potential hazard relative to the potential for exposure is described below.

4.1 CHEMICAL HAZARDS

There are no known chemical hazards identified in groundwater beneath the SNCC facility. Based on our knowledge of the shallow groundwater quality from other regulated waste disposal sites within the vicinity, the concentrations detected in the SNCC monitoring wells appear to be within range of expected water quality values.

4.2 PHYSICAL HAZARDS

Physical hazards associated with this project include working near heavy equipment (e.g., a drill rig), physical strain associated with drum handling and sampling activities, pinching/cutting/crushing associated with use of mechanical sampling devices and hand tools, slip/trip/fall due to uneven ground surface, , weather conditions, venomous insects, and noise.

4.2.1 General

Uneven ground surface and/or debris may increase risk of injuries. Personnel shall wear appropriate footwear while on site. Personnel shall wear hard hats, brightly colored (orange/yellow) vest or equivalent, and shall be aware of equipment activities at all times. Keep within view of operators and out of the vicinity of heavy equipment unless required for a specific task. On-site personnel need to be aware of the position and movement of heavy equipment at all times. Adequate clearance from the equipment will be maintained at all times. Eye contact will be maintained by personnel with the equipment operator prior to passing in front of the equipment.

4.2.2 Noise

Noise levels around heavy equipment can exceed a comfortable range; ear plugs are recommended. Use of hearing protective devices (HPDs) is required whenever the noise level equals or exceeds 85 decibels (dBA). In the absence of noise

monitoring equipment, an elevated noise level will be defined as a situation where a person cannot be heard above equipment noise while speaking in a normal voice from a distance of two feet. If this condition occurs, the SSO will require that personnel affected by the noise hazard use HPDs.

4.2.3 Equipment Safety

Standard operating safety procedures will be followed by H&K and its subcontractors working around mechanical equipment. Equipment shall be in good operating condition and used in accordance with manufacturer's specifications. Rags, towels or other absorbent materials will be available to clean up any incidental spills. No hazardous materials in excess of reportable quantities will be brought on-site by H&K personnel. Attention should be paid to lateral and overhead equipment clearance, particularly when the drilling mast is being raised or lowered. Proper handling techniques must be followed when working with drums and sampling equipment.

4.2.4 Sunburn

Working outdoors on sunny days for extended periods of time can cause sunburn to the skin. Excessive exposure to sunlight is associated with the development of skin cancer. Field personnel should take precautions to minimize the risk of sunburn by using sun-screen lotion of at least 15 SPF and/ or wearing hats and long-sleeved garments.

4.2.5 Venomous Insects, Arachnids and Snakes

The project site provides potential habitat for rattlesnakes, and venomous insects and arachnids. Field personnel will wear boots and long pants to reduce potential bite exposure areas. Care should be taken in approaching and accessing areas where snakes and insects may be hidden. Personnel should periodically check clothing, hair and skin during the workday for the presence of ticks.

4.2.6 Hazards Associated with Sampling Activities

In general, because the use of heavy equipment is anticipated in conjunction with drilling and mechanical equipment is used for groundwater sampling, the overall hazard for this activity is considered to be moderate. Hazardous materials are likely to be encountered at low concentrations, and a low level of personal protection (Level D) is required.

5 TRAINING REQUIREMENTS

All H&K personnel working on-site have completed training in hazard recognition and basic health and safety issues as required by OSHA regulations contained in 8 CCR 5192 and 29 CFR 1910.120 (e). In addition, each H&K employee working on site and each subcontractor will be familiar with the requirements of this task-specific SSP, and will participate in site activity and safety briefings. The SSO will document site safety activities and implementation of this plan. Prior to new field activities, H&K and subcontractor personnel will conduct a tailgate safety briefing in the field.

6 PERSONAL PROTECTIVE EQUIPMENT

Based on the chemical information and hazard analysis, Level D protection will be initially required for drilling and sampling activities.

Level D protection consists of steel-toed boots, long pants, hard hat, hearing protection, safety glasses or goggles, and gloves if in contact with debris and/or contaminated soil.

7 MEDICAL SURVEILLANCE REQUIREMENTS

Medical surveillance of H&K employees is to be conducted meets the requirements of 8 CCR 5192 and 29 CFR 1910.120 (f). There are no identified additional medical surveillance requirements associated with this project.

8 SITE CONTROL MEASURES

The potential chemical and physical hazards have been identified in this SSP; however, should site specific or unexpected conditions arise, the SSO will stop all work at the site and the Project Manager will be notified. Work will not be completed until the SSP has been revised or re-evaluated accordingly.

Break or eating areas shall be located away from the work zone and preferably upwind. In the instance where work is continued to the next day, the work site shall be secured prior to leaving the site. Communication between field team members will consist of verbal communication and hand signals if necessary. Radio communication is not required for this project.

8.1 DAILY START-UP AND SHUTDOWN PROCEDURES

The following protocol will be followed prior to daily start-up and shutdown during field activities:

1. The SSO will review site conditions with respect to modification of work and the task specific SSP;
2. Field personnel will be briefed and updated on safety procedures;
3. The SSO will ensure that first aid equipment is readily available;
4. At the shutdown of daily operations, and in between individual field events, all reusable equipment will be decontaminated and secured.

8.2 WORK ZONES FOR EXCAVATION ACTIVITIES

The primary means of maintaining site control and reducing the potential for migration of hazardous materials into uncontaminated areas during sampling activities will be by the use of disposable sampling equipment and decontamination of reusable equipment between each sampling event.

8.3 TRAFFIC CONTROL

H&K does not anticipate that traffic control will be necessary for the proposed site work.

8.4 WORK PRACTICES

Safe work practices for this project are listed below:

1. Set-up, assemble, and check all equipment for integrity and proper function before starting work activities.
2. Do not use faulty or suspect equipment.
3. Use only new and intact protective clothing. Change gloves, etc., if they tear.
4. Do not use hands to wipe sweat away from face. Use a clean towel or paper towels.
5. Practice contamination avoidance at all times.

6. Do not smoke, eat, or drink within the excavation and sampling areas.
7. Wash hands, face and arms at all breaks and prior to leaving the site at the end of the work day.
8. Perform decontamination procedures completely as required.
9. Notify the Project Manager immediately if there is an accident that causes an injury or illness.

8.5 EMERGENCY MEDICAL TREATMENT

In the event that non-emergency medical treatment is necessary, the nearest medical facility is Glenn Medical Center at 1133 West Sycamore Street, Willows, California. The 24-hour emergency care phone number is 530-934-1800. In the event of a medical emergency, local rescue agencies should be contacted by calling 911.

Directions to the hospital are as follows:

Depart: 6505 County Road 39, Willows, CA 95988-9709

1. Depart Bayliss Blue Gum Rd / County Road 39 toward I-5 / County Road 99W
2. Turn left onto I-5 / County Road 99W
3. Turn right onto Bayliss Blue Gum Rd / County Road 39
4. Take ramp right for I-5 South toward Sacramentoi
5. At exit 603, take ramp right for CA-162 toward Willows / Oroville
6. Turn left onto CA-162 / W Wood St
7. Turn right onto N Enright Ave
8. Turn right onto W Sycamore St
9. Arrive at 1133 W Sycamore St, Willows, CA 95988-2601 on the right

The Figure 1 shows the route form the subject property to Glenn Medical Enter.

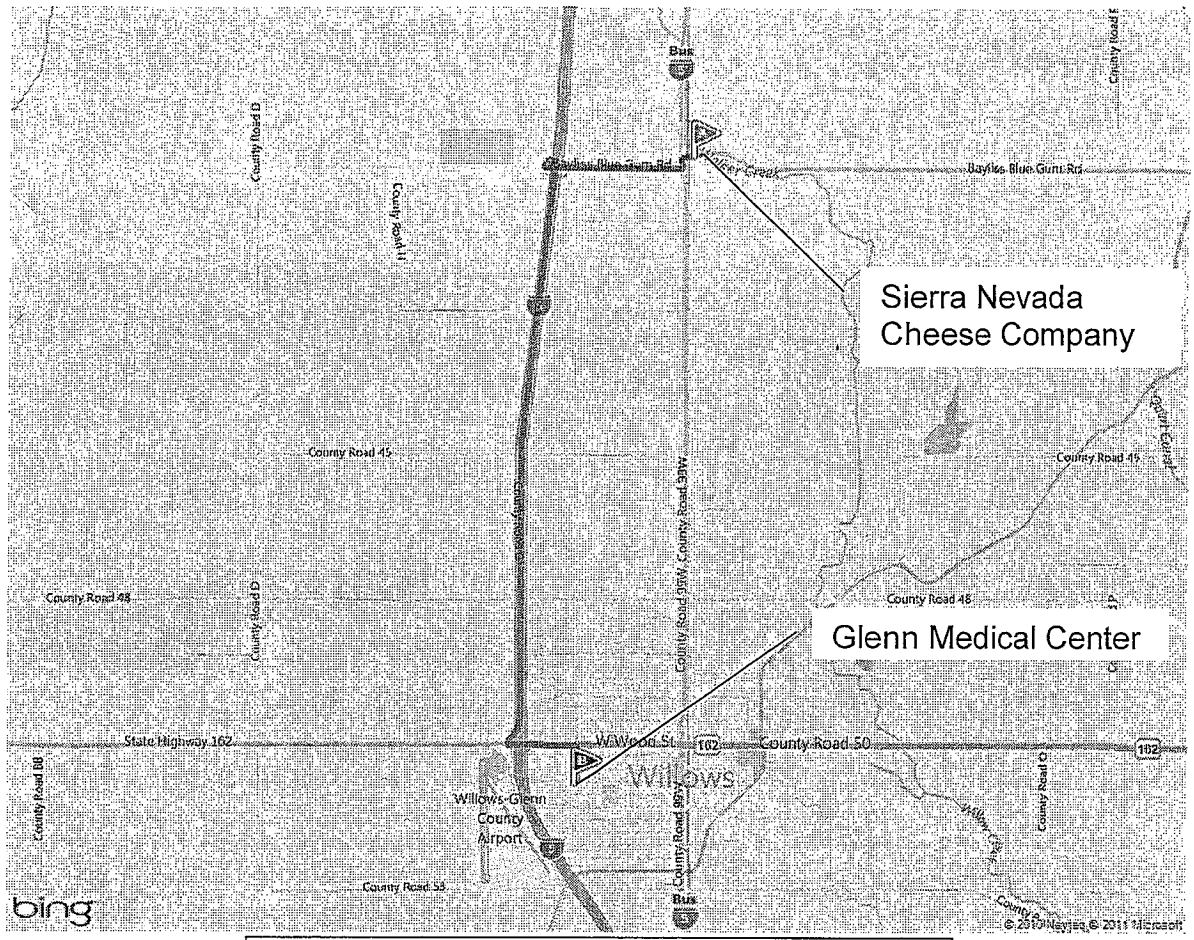


Figure 1: Medical Facility Route Map

9 DECONTAMINATION

Decontamination procedures associated with drilling and groundwater sampling activities will take place prior to leaving all work areas and sample locations and/or prior to reusing equipment at a new sampling location, as set forth in the scope of work.

10 REFERENCES

10.1 FEDERAL HEALTH AND SAFETY REQUIREMENTS

EPA Order 1440.1- Respiratory Protection

EPA Order 1440.3- Health and Safety

NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. June 1994.

OSHA Safety and Health Standards 29 CFR 1910 (General Industry), U.S. Department of Labor, Occupational Safety and Health Administration.

OSHA 29 CFR 1910.120 Hazardous waste Operations and Emergency Response, Final Rule, U.S. Department of Labor, Occupational Safety and Health Administration.

OSHA Safety and Health Standards 29 CFR 1926 (Construction Industry), U.S. Department of Labor, Occupational Safety and Health Administration.

Standard Operating Safety Guidelines, USEPA, Environmental Response Branch, Hazardous Response Support Division, Office of Emergency Response.

10.2 STATE HEALTH AND SAFETY REQUIREMENTS

California Code of Regulations, Title 8, Chapter 4, Subchapter 4, Construction Safety Orders.

California Code of Regulations, Title 8, Chapter 4, Subchapter 5, Electrical Safety Orders.

California Code of Regulations, Title 8, Chapter 4, Subchapter 7, commencing with Section 3200, CAL/ OSHA General Industry Safety Orders.

California Code of Regulations, Title 22, Division 4, Chapter 30, commencing with Section 66000, California Department of Health Services, Toxic Substances Control Program.

APPENDIX

Health and Safety Plan Acknowledgment Form

Accident Report Form

HEALTH AND SAFETY PLAN ACKNOWLEDGMENT FORM

The undersigned acknowledges that he/she has received a copy of the Task Specific Health and Safety Plan for the Sierra Nevada Cheese Company facility and that he/she has read and understands the contents of the plan.

Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date
Name	Company
Signature	Date

ACCIDENT REPORT FORM

This form should be completed in the event of an accident on-site which involves H&K, subcontractor, LEA or client personnel resulting in illness or injury.

H&K Project No._____ Date_____

Project Name _____

Project Location_____

Accident Location_____

Personnel Involved _____

_____

Description of Incident _____

_____

_____

_____

_____

Action Taken _____

_____

_____

_____

Results _____

_____

SSO notified? Yes_____ No_____

If not, why? _____